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8. INTERIM REPORTING

"Interim reporting" is the term used to describe reports made by business firms on their operations for periods of less than a year. Quarterly reports to stockholders are interim reports as are monthly and quarterly reports by business to various Government agencies like the Census Bureau, SEC, and FTC. That accountants use "interim report" suggests that it means something different from firms' annual reports. And indeed interim reports are different in the eyes of the accounting profession, for their preparation does not receive the same care as annual reports. The view that annual reports are recurrent benchmarkings or stocktakings of a firm's financial operations and conditions has been deeply rooted in the thinking of accountants as is apparent from the way they organize their work through the year.

Accountants take many actions at the end of an accounting year that they do not do during the year because of conventions that attach greater importance to the annual report. To cite a few simple examples, they usually take a physical count of inventories at yearend that may yield an inventory total different from what is being carried on the books; therefore, adjustments are made at yearend to correct inventory levels. As a consequence, the change in inventories in the final interim period is distorted. Further, firms who value inventories at the lower of cost or market may mark down values of inventories to market at yearend. Also, firms may use one basis for charging purchases and withdrawals from inventory during the year and a different one at yearend. Thus, during the year goods may be charged to inventory when the invoice is received but at yearend legal ownership will be used as the basis. There are variations in definitions of legal ownership. Some contracts specify that legal title does not pass until the purchaser has physically acquired the goods. Other contracts specify that goods are acquired when they leave the shipper's premises.

To the extent that such yearend adjustments are made in the same direction year after year and are roughly of the same magnitude, adjustments tend to disappear in seasonally adjusted data. Recurring yearend adjustments need to be accounted for by seasonal factors. When yearend adjustments are irregular, however, they do not disappear so that resulting monthly inventory changes may reflect yearend accounting adjustments as well as underlying physical volume and price changes. The unusually high rates of inventory accumulation recorded in the fourth quarters of 1966 and 1973 may be a result of such accounting adjustments.

It is only recently that controversy over interim reports has emerged in the accounting profession. The controversy has important implications for the reporting of inventories and

other statistics to Government agencies for use as economic indicators and in calculation of the GNP.

ACCOUNTING PRINCIPLES BOARD OPINION NO. 28

The latest official thinking of public accountants regarding public reporting of interim results is contained in APB Opinion No. 28, which became effective for fiscal years starting after December 31, 1973.¹ With this opinion it was recognized that practices with respect to interim reporting varied widely. This was attributed to fundamentally different views concerning objectives of gathering interim financial information. According to one view each interim period should be treated as a basic accounting period, the results of which should be determined in the same manner as annual results. Deferrals, accruals and estimations would thus be governed by the same principles and judgments that apply to annual periods. According to the other view, the interim period should be viewed as an integral part of the annual period. Deferrals, accruals and estimations at the end of each interim period would be affected by judgments made at the interim date concerning the rest of the year. In essence proponents of the second view would tolerate more smoothing or normalizing for interim periods. The second view is recommended in Opinion No. 28, that is, each interim period should be viewed primarily as an integral part of annual reporting.

It may come as a surprise that as late as 1973 the accounting profession, while recognizing the value of interim financial information, should nonetheless favor an opinion that gives little emphasis to the importance of business cycles. It is surprising because one of the great advances in economic information gathering in the post-World War II period has been development of quarterly national income and product accounts. Indeed, a distinguishing characteristic between a highly sophisticated system of economic intelligence, like that of the United States, and one less sophisticated is the provision of quarterly national income accounts. It is hard to conceive that governments or large businesses could conduct their affairs well without sets of quarterly accounts.

Support for the dominant view expressed in APB Opinion No. 28 may reflect concerns of the accounting profession about

¹American Institute of Certified Public Accountants, Inc. APB Opinion No. 28, Interim Financial Reporting, 1973. Accounting standards are now being issued by a new organization, the Financial Accounting Standards Board (FASB).

inadequacies in information underlying interim reports. In APB Opinion No. 28 it is stressed at the outset that many costs and expenses must be estimated for interim periods because there is insufficient time to develop complete information on quarterly bases. Specifically it is noted that time available may be insufficient to undertake extensive reviews of inventory items, and that many companies use shortcut procedures. Public accounts are not alone in viewing quarterly data as inferior to annual data. BEA has always considered its annual income and product figures to be more reliable than quarterly data because they are based on more accurate and complete information.

APB Opinion No. 28 evoked a dissent from three members of the board. In their view any interim period is "both a discrete accounting period and a fraction of an annual period in the same sense that an annual period is both a discrete accounting period and a segment of the period representing the life of the enterprise."² They felt that financial statements for any period should reflect events of that period and objected to the normalizing which they felt was encouraged by the majority view in Opinion No. 28.

Apparently there was sufficient dissatisfaction with APB No. 28 to cause FASB to reconsider it. A task force was formed to take another look at interim reporting. A discussion memorandum was expected in mid-1978.

Part of the concern over interim reporting standards doubtless is caused by shortcut methods used by companies in preparation of interim reports. For example, the fact that some companies use estimated gross margins or markups to determine costs of goods sold in interim periods is noted in the opinion (paragraph 14a). The AICPA board goes on to state that where such methods are used it should be disclosed, and that firms should reveal "significant adjustments" resulting from reconciliations with annual physical inventories.

How prevalent the gross profit method is as an interim technique is unknown. Its accuracy depends on a firm's success in projecting its gross margins. To the extent that gross margins used to estimate inventories are based on recent past experience and there is systematic variation in percentages over the business cycle, use of this method can introduce temporary biases into interim data. If gross profit percentages widen, for example, using this method leads to abnormally large estimated inventory changes in the final month or quarter of the year following understatements of inventory changes for all preceding interim periods of the given year.

For instance, in the case of a retailer of a product who begins a year with a physical inventory of 10 units at a value of 1 per unit, the retailer estimates a gross margin to be 40 percent of the sales price, and arrives at the estimated value of inventory by the formula:

$$\text{Beginning inventory} + \text{purchases} - 0.6 \text{ sales} = \text{ending inventory.}$$

²*Ibid.*, p. 357.

This procedure may be continued through the year until it is replaced by an inventory figure based on a physical count, presumably at yearend.

In practice the method is susceptible to error not only because of possible mistakes in predicting true margins for particular products, but because margins may vary by product and because the mix of products sold may be difficult to forecast. Furthermore, if a firm uses a single gross margin throughout the year, it may be a good estimate for the year but incorrect for each quarter. Suppose a firm has a margin of 0.40 on the basis of recent-year experience but in the first half of the year the true margin is 0.45 and in the second half, 0.35. The firm will underestimate its inventory on June 30 and rectify the error on December 31. The inventory change for the entire year will be correct but each half-year change will be in error.

SEC ON INTERIM REPORTING

Attitudes of the accounting profession toward interim reporting were partly a reflection of attitudes of the SEC on this subject, at least until fairly recently. SEC had always been concerned with false and misleading statements, as the *Mattel* case illustrated.³ This firm reported significant profits in each of the first three fiscal quarters of 1972, but SEC ascertained that Mattel should have been reporting losses. In a request for an injunction against the company, SEC cited numerous practices that had the effect of understating costs, among them inadequate provision for obsolete inventory and inventory shrinkage.

The *Mattel* case was obviously extreme. Firms have long been required to file form 8K to report unusual charges against and credits to income. SEC has noted the tendency of firms to file these late in the year. But there were no requirements regarding inclusion of quarterly data in annual 10K reports. After a period in which semiannual reports were required, SEC in 1968 imposed quarterly reporting. However, quarterly reports (form 10Q) required of registrants was limited, for all practical purposes, to only two items from profit and loss statements—sales and profits.

In the fall of 1975 SEC imposed new requirements on registrants for reporting quarterly data. What was significant in the Commission's General Statement⁴ was recognition that annual reports alone could obscure significant cyclical shifts in fortunes of individual companies and that quarterly data would supply information for sufficiently short periods to reflect cyclical turning points. While not requiring auditing of quarterly reports, the Commission believed that such audits would occur and would reduce the necessity of revising quarterly data at time of publication of yearend statements. A new rule,⁵ which became effective after December 25, 1975, requires footnotes to be appended to annual reports showing quarterly results for the

³Complaint for Injunction 74-1185, Securities and Exchange Commission against Mattel, Inc., U.S. District Court of the District of Columbia, Aug. 5, 1974. Other years were also involved.

⁴Securities and Exchange Commission, Accounting Series Release 177, September 10, 1975.

⁵SEC Rule 3-16(t).

two most recent years. It also requires expanded reporting on quarterly form 10Q: income statements for the most recent quarter; condensed sources and uses of funds statements on a year-to-date basis; and balance sheets for the most recent quarter. Similar data for the preceding year ordinarily are required.

Several critics took issue with the SEC's mandatory requirements, stressing, among other things, the imprecise nature of quarterly data. The Commission recognized the imprecision of short-period estimates and noted it was not challenging the traditional accounting practice of making the best estimate practicable at the time and then making subsequent adjustments as needs became apparent. The Commission stated that "... estimates are a necessary part of all financial reporting," and that registrants have had long experience in making quarterly estimates. The 1975 rule⁶ also requires disclosure of aggregate effects and nature of yearend and other adjustments which are material to results of each quarter presented.

The Commission permitted registrants to identify quarterly footnoted data in annual reports as unaudited. However, it called upon the accounting profession to establish standards for reviewing interim data that would provide some auditor responsibility. SEC stated that registrants would find it useful to have independent auditors review quarterly financial data on a timely basis throughout the year, prior to filing form 10Q and it encouraged such reviews. While not an audit, SEC believed this would improve quarterly reporting.

INTERIM LIFO

Concern about interim reporting standards also, in part, stemmed from rapid growth in use of LIFO accounting in recent years. LIFO generally is viewed as an annual calculation whose practical effect is to reduce firms' tax liabilities. Since tax liabilities largely are annual in nature, it is understandable under the circumstances that field investigations for this study found that many companies were having great difficulty in adapting LIFO to a quarterly framework.

Guidance for quarterly reporting of LIFO inventories has taken two forms so far as published materials are concerned: (1) Some public accounting firms have issued manuals that describe how LIFO should be treated quarterly.⁷ (2) The Accounting Standards Division of the AICPA sent a letter on October 9, 1975 to FASB requesting FASB's views on some principles AICPA believed should be followed for interim LIFO. The letter provided examples that could be used as a guide by business for interim LIFO. The Standards Division viewed the problem as one that required prompt resolution so companies could avoid inconsistent reporting. The 1975 date is of interest and suggests that the interim reporting problem became prominent only after shifts by many companies to LIFO, which to some extent caught the profession by surprise.

⁶*Ibid.*, Section 3.

⁷See, for example, Coopers & Lybrand, *LIFO: A Guide for Corporate Decision Makers* (New York: Coopers & Lybrand, 1974).

Examples from AICPA

Tables 8.1, 8.2 and 8.3 provide the basis for illustrating various techniques suggested by AICPA for determining interim inventories by LIFO firms. For these tables it is assumed that a company has just adopted LIFO and that the price index applicable to inventories is as follows (prices in opening inventories = 100):

1st quarter	100
2nd quarter	103
3rd quarter	105
4th quarter	109
Average for year	104.25

In this example, it is assumed that all quarterly calculations are performed end-of-year rather than after the end of each of the first three quarters. An example of computations made at the end of each quarter is provided later.

Table 8.1 includes basic quarterly information calculated on a FIFO basis. Table 8.2 shows underlying LIFO calculation steps taken at the end of year before quarterly calculations can be made. These are identical to ordinary annual dollar value LIFO calculations described earlier.⁸ In table 8.2, inventories in terms of prices of beginning inventories are shown on line 2. The increase over beginning inventories (line 3) is then revalued in terms of average prices for the year (line 4). Use of average annual prices is one of several options available to LIFO firms. The difference between ending LIFO and FIFO inventories is the LIFO adjustment, or the increase in the LIFO reserve. The interim reporting problem is to apportion this LIFO adjustment to each of the four quarters.

One technique suggested by AICPA is to divide the LIFO adjustment equally among quarters. This is referred to as the pro-rata basis. Its results are illustrated in the second and fourth columns of table 8.3. Thus, the FIFO inventory at the end of the first quarter less the LIFO reserve of 26 equals the LIFO inventory of 1,004.

According to a second method, the reserve may be apportioned relative to quarterly sales, or quarterly cost of goods sold where cost of goods sold is calculated on a FIFO basis. Results using the sales in table 8.1 are shown in the third and fifth columns of table 8.3.

Finally, of course, AICPA notes that if firms have sufficient information they can calculate each end-of-quarter inventory as though it were the end of year by deflating end-of-quarter FIFO values to base period prices and reflatting the changes by average prices for respective quarters.

Ex Ante Calculations

If quarterly calculations are not made at the end of each quarter as they would be at end of year, the recommended procedure is for firms to make projections of yearend physical

⁸See chapter 6.

Table 8.1. EXAMPLE: INVENTORY CALCULATED QUARTERLY ON A FIFO BASIS

Item	FIFO			
	1st quarter	2nd quarter	3rd quarter	4th quarter
Inventory at start of period.....	1,000	1,030	1,100	1,250
Purchases.....	830	1,420	1,660	1,240
End of quarter inventories.....	1,030	1,100	1,250	1,400
Cost of goods sold..	800	1,350	1,510	1,090
Sales.....	1,275	2,025	2,265	1,635
Gross profit.....	475	675	755	545

quantities and prices. If beginning inventories are 1,000 for a new LIFO firm and it is assumed that prices in inventories and physical quantities will each be 10 percent greater than at the beginning of year, projected yearend inventories would be 1,210 in FIFO terms:

$$1,000 \times 1.10 \times 1.10 = 1,210.$$

With this projection of yearend inventories on a FIFO basis, the LIFO reserve must be estimated. If a firm has decided to use the early prices LIFO option, the LIFO reserve will be about 110; if it has selected the latest prices option, the LIFO reserve will be 100; and if the firm has opted for a reflating index which is an average of prices during the year, the LIFO reserve in this hypothetical calculation will be about 105. Suppose the firm estimates 110 as its annual LIFO reserve and the end of the first quarter FIFO inventory is 1,052. Using the pro-rata method yields a LIFO reserve of 27.5 for the end of the first quarter ($1/4 \times 110$) and the LIFO inventory would equal $1,052 - 27.5 = 1,024.5$.

If firms make errors in forecasting yearend quantities and prices, estimates of interim inventories will also be in error. At the end of the year they will have to make adjustments that distort reported inventory change in the final accounting period. If prices are projected too low, the LIFO inventory change dur-

Table 8.2. ILLUSTRATION OF END-OF-YEAR STEPS REQUIRED BEFORE INVENTORIES CAN BE CALCULATED QUARTERLY ON A LIFO BASIS

Item	Value	Calculated by
1. End-of-year FIFO inventories.....	1,400	
2. End-of-year inventories in beginning or base prices..	1,284	$(1,400 \div 109)^1$
3. Annual increment in beginning prices.....	284	$(1,284 - 1,000)$
4. Value of annual increment at yearly average prices..	296	(284×1.0425)
5. End-of-year LIFO inventories.....	1,296	$(1,000 + 296)$
6. LIFO adjustment or increase in LIFO reserve.....	104	$(1,400 - 1,296)$

¹The calculation on line 2 is technically incorrect, although it is the type of flaw often overlooked in practical applications of the LIFO method. A more appropriate calculation of the stock in base period prices would be:

$$(1,240 \div 109) + (160 \div 105) = 1,290.$$

Since the FIFO value of inventory exceeds fourth quarter purchases, that portion of the FIFO inventory (160) purchased in the third quarter must be deflated by the third quarter price index.

ing the year will be overstated and in the final period will be understated, other things being equal. Too high a price projection will yield a downward bias for the inventory change during the year and an upward bias compared to actual in the final accounting period. Aside from the usual difficulty of projecting future price movements, it is assumed in the pro-rata method that quarter-to-quarter price changes are uniform. In the preceding example, it was assumed that prices rose roughly 2.5 percent per quarter. If there were no actual price rise in the first quarter, a firm with the ability to do a proper LIFO calculation would have a zero increment in the LIFO reserve. If it estimated on the pro-rata basis described with the facts given, it would incorrectly estimate a 27.5 increment in the LIFO reserve.

Table 8.3. EXAMPLE: INVENTORIES CALCULATED QUARTERLY ON PRO-RATA AND SALES BASES

Quarter	FIFO Inventories, End of Quarter	LIFO Reserve		LIFO Inventories, End of Quarter	
		Pro-rata Basis	Sales Basis	Pro-rata Basis	Sales Basis
1	1,030	26	18	1,004	1,012
2	1,100	52	48	1,048	1,052
3	1,250	78	80	1,172	1,170
4	1,400	104	104	1,296	1,296

In tables 8.4 and 8.5 an example is provided of what would happen if actual prices turned out to be higher than a firm had projected at the beginning of the year. This kind of forecasting error has been especially common among economists over the past several years of rapid inflation and accountants probably are subject to the same shortcoming.

Suppose that the firm at the start of the year has stocks of 1,000 and has projected a quarterly price pattern as shown below on the left instead of the actual pattern as shown on the right. Suppose further that it makes LIFO projections for the end of the year shown in the left column of table 8.4. The data used in this example are those appearing in tables 8.1 and 8.2.

Quarter	Projected	Actual
1	100	100
2	101	103
3	103	105
4	105	109
Yearly average (reflating index)	102.25	104.25

Interim LIFO results for the first three quarters using the pro-rata basis recommended by AICPA coupled with an actual for the end of the year are shown in table 8.5. The firm has projected that the LIFO reserve for the entire year will total 58 and consequently has distributed one-fourth of 58 (cumulatively) to each successive quarter. Actual FIFO values are given in the first column. The estimate of the LIFO reserve is in error in the first three quarters due to the underestimate of the price increase. In each of the first three quarters the LIFO reserve is too low and estimated LIFO inventories are too high. At year-end closing corrections are made that distort the movement from the third to the fourth quarter. Whereas the inventory change in the first three quarters was overstated compared to what the estimate for these quarters would have been if the

projected price change had been accurate, in the final quarter it is understated. Results from an accurate projection of the annual price change are shown in column (7) and the difference in inventory change is shown in column (8). The effect on profits before tax would be the same—they are overstated in the first three quarters and understated in the closing quarter.

A specific example of the preceding problem is provided by fourth quarter results for Sears Roebuck as reported in *The Wall Street Journal* of March 23, 1977:

Arthur M. Wood, chairman [of Sears], said fourth quarter earnings before taxes and expenses are \$21 million lower than expected because government indexes used to eliminate inflation from inventory values for accounting purposes were higher than expected.

Sears recently converted to LIFO and apparently uses the BLS department store index in its annual LIFO calculations. This BLS index rose faster over the year than Sears had projected in its interim estimates of the LIFO reserve. Hence, the firm had a large increment in the LIFO reserve in the fourth quarter similar to (although not as extreme as) the data appearing in column (2) of table 8.5. Sears' fourth quarter profits appeared low in its financial statement as a result because the LIFO reserve is subtracted from profits. The \$21 million is not large relative to the estimated \$625 million earned before taxes in the final quarter, although it is a little more important in the change in profits of about \$300 million from the third to the fourth quarter.

The manner by which LIFO firms make price forecasts was not systematically investigated for this study. However, one large retailer who was visited made price projections on the basis of the most recent 12-month experience. That is, the projected price change one year ahead was equal to the actual change over the most recent 12-month period. This kind of projection—a common form of "naive model" frequently used to evaluate forecasts—will obviously result in errors around turning points, when changes in the rate of inflation have often occurred.

Table 8.4. ILLUSTRATION OF ANNUAL INVENTORY CALCULATIONS USING THE LIFO METHOD; ACTUAL PRICES HIGHER THAN PROJECTED

Item	Projected	Actual ¹
1. End-of-year FIFO inventories	1,348	1,400
2. End-of-year inventories in beginning prices	1,284	1,284
3. Annual increment in beginning prices	284	284
4. Value of annual increment at yearly average prices (rounded)	290	296
5. End-of-year inventories	1,290	1,296
6. Addition to LIFO reserve	58	104

¹This column is as presented in table 8.2.

Decreases in LIFO Stocks

Reporting LIFO inventories that fall below quantities held at the beginning of the year poses special problems. If the reduction is a temporary one in the sense that a firm anticipates by yearend it will have restored the depletion, the interim reduction need not be reported as such according to principles enunciated in APB Opinion No. 28. A temporary reduction in LIFO stocks may increase profits temporarily because a LIFO liquidation would cause cost of goods sold to reflect—in addition to current prices of purchased goods—the low prices in earlier LIFO stocks that are depleted. To avoid this kind of temporary distortion of cost of goods sold, inventories may be reported at a higher level than they are in fact; cost of goods sold for the interim period under this procedure reflects the estimated cost of replacing the liquidated LIFO stock. When the depletion of

Table 8.5. EXAMPLE: EFFECTS OF PRICE PROJECTIONS ON QUARTERLY INVENTORY PROJECTIONS USING A PRO-RATA BASIS

Quarter	FIFO Inventories, End of Quarter (1)	Projected Incorrectly			Projected Correctly			Col. 4 Minus Col. 7
		LIFO Reserve (2)	LIFO Inventory (3)	Change in LIFO Inventory (4)	LIFO Reserve (5)	LIFO Inventory (6)	Change in LIFO Inventory (7)	
1	1,030	14.5	1,015.5	15.5	26.0	1,004.0	4.0	11.5
2	1,100	29.0	1,071.0	55.5	52.0	1,048.0	44.0	11.5
3	1,250	43.5	1,206.5	135.5	78.0	1,172.0	124.0	11.5
4 (Actual) . .	1,400	104.0	1,296.0	89.5	104.0	1,296.0	124.0	-34.5

stocks is restored within the year, the adjustment is eliminated. For this study the importance of this practice could not be quantified, but examples of it were found in two very large companies contacted in field visits. To illustrate, assume the following:

Item	Units	Value	Units	Value
Beginning LIFO inventory.	10	80		
Last year's LIFO layer			1	10
First quarter actual purchase . . .	5	60		
Sales	6			

A strict application of LIFO would be to record cost of goods sold as 70 (5 at 12 each and 1 at 10). To avoid this distortion when stocks are likely to be replaced before yearend and there will be no "invasion" of the prior year layer at a lower price in a final annual calculation, an accepted practice is to create a fictitious unit of inventory at the current price. In this example, a purchase of 1 unit at 12 would be "made" and added to inventory, offset by a fictitious accounts payable. The firm would then report cost of sales of 72, but inventories would be carried on the balance sheet as 10 units at a value of 80 when there were actually only 9 units held in inventory.

Neither APB Opinion No. 28 nor the manuals provided by accounting firms define a "temporary decline." Adjusting LIFO inventories for temporary declines represents a kind of normalizing and may represent a crude kind of seasonal adjustment of interim inventories. To the extent the adjustment is like a seasonal adjustment it is quite understandable that accountants should make it. However, for tabulating inventory statistics, as in the Census surveys, this procedure is clearly unsatisfactory. It creates inventory where none exists. Even though the error is rectified later when the inventory is actually restored, an interim inventory value and at least two quarterly changes are in error.

Developing an accounting procedure for interim reporting of such depletions seems simple enough. Accountants' objec-

tives of not distorting cost of goods sold and profits could be met by adopting the following convention: If a depletion is considered temporary and there will be no later recourse to unit prices of the prior LIFO layer, the depletion should be recorded at the current price. If the depletion is likely to remain by the end of the year, it may be recorded at the earlier LIFO layer price. In the example just given, if the depletion of 1 unit is expected to be replaced, the inventory value should be recorded at 68 (80 - 12). By this procedure the quarterly value changes in inventory would always be in the correct prices, cost of goods sold would not be distorted and there would be no resort to imaginary physical stocks.

Results of Field Investigations

Difficulties in reporting inventories by LIFO companies to the Census Bureau in recent years were not wholly unexpected in view of the fact that LIFO was new for many companies. Moreover, it was unlikely that firms would take the same care in making LIFO calculations at the end of a month or quarter as they would at the end of a fiscal year. There had been concern about the reporting of monthly figures by LIFO firms to the Census Bureau, but the full extent of the reporting problem was not seen until Census Bureau personnel conducted field checks of the monthly inventory figures being reported in the manufacturing and trade surveys. The outcome of these field checks were recommendations that immediate steps be taken to remedy some of the deficiencies turned up by the investigators. Some of the steps that have already been taken are noted later.

The initial field check, conducted in late 1975, covered 39 large companies who were LIFO firms. Results are shown in table 8.6. Of the 39 companies, 11 were not reporting either LIFO level or LIFO change figures to the Census Bureau in its monthly survey. Another 12 to 13 were reporting a LIFO figure only at yearend. For all other months these companies were reporting FIFO changes to the Census Bureau. Finally, of the 15 to 16 companies who were reporting monthly LIFO, only half were submitting a carefully constructed monthly LIFO change and the others were estimating by various procedures. The 39 firms did not constitute a probability sample.

Table 8.6. INTERIM REPORTING BY 39 LARGE LIFO FIRMS TO THE CENSUS BUREAU

Procedure	Manufac- turing	Retail	Whole- sale	Total
A. Not LIFO in level or change	4	5	2	11
B. FIFO changes for 11 months at LIFO level . . .	6	2	4½	12½
C. Monthly LIFO				
1. Detailed calculations . .	5	1	1	7
2. Other	4	3	1½	8½
Total number of firms .	19	11	9	39

Source: Bureau of the Census, based on field and telephone interviews.

Included on Line A are some LIFO companies not reporting LIFO inventories to the Bureau of the Census because of misunderstandings that existed at the company level. Field work, conducted by Census with NBER, regarding inventory valuation methods demonstrated that as of late 1975-early 1976 LIFO was not well understood by many companies, including some that are very large. Frequently LIFO procedures used by a company might be known only to a small number of persons even though the firm employed many accountants. In such cases the Census Bureau did not obtain information on the firm's LIFO stock because the Bureau's contact in the company was unfamiliar with the subject and reported the preLIFO value.

Line A, table 8.6, also includes another kind of problem case. Under the provisions of the Internal Revenue Code LIFO firms are forbidden by law to show their profits on a nonLIFO basis (say, FIFO). IRS has interpreted this conformity provision very strictly. For this reason some firms were wary in responding to Census Bureau survey inquiries about accounting methods and always replied they were LIFO companies, regardless of what they were actually reporting. Others would not report their LIFO reserve when asked to do so. Fortunately, this problem has been resolved. The entire subject of conformity is covered in chapter 6. IRS, in its Revenue Procedure 76-36 (see appendix F), has relaxed its conformity rules and permits LIFO firms to report detailed types of data needed by Census without danger to or loss of the LIFO election for valuing inventories. Of course, this does not permit the public reporting of profits on both bases.

Line B, table 8.6, embraces a fairly common type of reporting to the Census Bureau, namely firms that make only a single LIFO calculation at yearend. For interim months these firms report a FIFO or FIFO-type inventory change at a LIFO level. Companies in this category maintain an unchanging LIFO reserve for 11 months of the year and then make the correct year-end calculation in, say, December. This results in distortions through the year, especially in the final period. Data reported by such firms could resemble the table below, where, for simplicity, quarters rather than months have been used and a December closing has been assumed. Note that it is only the third line that is reported in a typical survey.

	De- cem- ber	March	June	Sep- tem- ber	De- cem- ber
FIFO inventories	95	105	115	125	135
LIFO reserve	5	5	5	5	10
LIFO inventories	90	100	110	120	125

In this example the firm starts off with a bona fide LIFO inventory and in the next three periods reports what appear to be correct LIFO figures. The clue to erroneous LIFO reporting comes from the constancy of the LIFO reserve and the sudden jump in the reserve in December. Correct LIFO reporting by such a firm might look like the following if the LIFO reserve grew gradually through the year:

	De- cem- ber	March	June	Sep- tem- ber	De- cem- ber
FIFO inventories	95	105.00	115.00	125.00	135
LIFO reserve	5	6.25	7.50	8.75	10
LIFO inventories	90	98.75	107.50	116.25	125

The third category (line C, table 8.6) includes reporters who probably were reporting current monthly LIFO values to the Census Bureau. Some used detailed estimating procedures similar to those employed at yearend but others used estimating procedures that may have produced inaccurate data. Included in this category were firms who kept reestimating yearend LIFO reserves as the year progressed but took no account of actual inventory changes that had already occurred. These firms might give results like those illustrated in table 8.5.

Department Stores—a Special Problem

For almost 30 years the Bureau of Labor Statistics has been calculating retail price indexes for department stores that use LIFO for valuing their inventories. The frequency and timing of this set of indexes raises special problems for interim reporting by retailers on LIFO. First, the indexes themselves, which apply to each of 20 departments or, in LIFO parlance, pools, are prepared twice a year, for January and July. Retail firms must therefore prepare extrapolating indexes for estimating BLS indexes for those months for which BLS does not calculate the departmental indexes. Second, the timing of indexes makes it unlikely that retailers can ever make use of them for current monthly estimates of inventories they send to the Census Bureau. The July indexes appear in early September, which is a few weeks after the regular publication of the Consumer Price Index. However, the Census Bureau closes its tabulations of the retail inventory data about 30 days after the end of the refer-

ence month. A feature of the Retail Inventory Survey is that only a single figure is collected for a month. If one allows two or three weeks time for retailers to receive the BLS indexes and apply them to their inventory data for use in estimating inventories, a true LIFO figure for July inventory is not available to the firm until early October, long after firms have reported for July.

Data Problems

The field investigations of LIFO reporters were very revealing; they showed a general lack of familiarity with LIFO among LIFO companies. One of the most important conclusions to be drawn from the investigation of interim LIFO reporting is that magnitudes like reported "actual" quarterly profits and inventories are in fact often dependent on forecasts of future events. There is little reason to believe that forecasting errors are random. It is well known that forecasts show systematic biases around business cycle turning points; these biases cannot fail to be reflected in quarterly actuals. So long as some firms estimate LIFO stocks by subtracting a projected LIFO reserve from FIFO-type inventories, these biases in currently reported data will persist.

Problems associated with interim reporting may be responsible for some peculiarities that have become apparent in the national income and product accounts in recent years. Two instances are: (1) the decline in profits plus IVA in manufacturing from the third to the fourth quarter of 1975 when manufacturing output was experiencing a rapid recovery; and (2) the large increase in nonfarm inventory investment in the fourth quarter of 1973. This increase is difficult to explain. Figures from BEA appear below with those for automobile inventories in auto GNP.

Firms are now required by SEC regulations to restate quarterly data, in footnotes to the annual report, when yearend adjustments have had a material effect on the quarterly pattern. Even on this ex post basis, the basic question is whether accountants' standards of materiality are sufficiently good for properly estimating U.S. totals of inventories and profits by Government agencies.

Recommendation for Interim LIFO Reporting

Interim reporting practices for 39 firms are shown in table 8.6. Since that table was prepared interim reporting problems

have been discussed with many more LIFO firms who have substantiated the various problems described. The simple fact is that for many LIFO firms an interim reporting method has not been satisfactorily developed.

This recommendation is addressed to the accounting profession. Those LIFO firms who do not make detailed calculations of interim inventories and rely instead on projections of yearend inventory quantities and prices, would be better served if they used the so-called shortcut method that BEA employed for many years in estimating the IVA for the GNP. It is assumed that such firms maintain monthly records of their inventories on a FIFO or average cost basis. The problem is to estimate the change in the LIFO reserve. The IVA is substantially the same as the increase in the LIFO reserve as calculated under the dollar value LIFO method. The shortcut method is no longer used by BEA since the operation has been fully computerized, but it was a simple way of approximating the quarterly IVA. The full calculation was cumbersome to do manually and was made only at the time of the annual GNP revisions.

An algebraic expression for calculating changes in the LIFO reserve when one has, say, FIFO book values for a period is:

$$\Delta \text{ in LIFO reserve} = \left(\frac{I_1}{P_1} - \frac{I_0}{P_0} \right) P_{A1} - (I_1 - I_0). \quad (1)$$

where

I_1 = Book value of inventory at end of period (FIFO)

I_0 = Book value of inventory at beginning of period (FIFO)

P_1 = Price index for deflating end of period FIFO value

P_0 = Price index for deflating beginning of period FIFO value

P_{A1} = Average price index for period 1, the reflating index.

We assume the case of LIFO with the average for the year as the reflating index.

This is the familiar form of dollar value LIFO in the first year of LIFO adoption. The formula for later years does not change the substance of this presentation. The shortcut formula is:

$$\Delta \text{ in LIFO reserve} = I_0 \left(1 - \frac{P_1}{P_0} \right). \quad (2)$$

The right-hand side of formula (1) may be manipulated as follows:

NONFARM INVENTORY INVESTMENT: 1973-1974

(Billions of 1972 dollars, seasonally adjusted annual rate)

Item	1973				1974	
	1st quarter	2nd quarter	3rd quarter	4th quarter	1st quarter	2nd quarter
Total nonfarm.....	11.6	12.0	11.5	21.7	14.4	9.3
Autos.....	1.4	1.3	-1.7	3.2	-2.1	-.1
Other.....	10.2	10.7	13.2	18.5	16.5	9.4

$$\frac{I_1 P_{A1}}{P_1} - \frac{I_0 P_{A1}}{P_0} - I_1 + I_0 = I_1 \left(\frac{P_{A1}}{P_1} - 1 \right) + I_0 \left(1 - \frac{P_{A1}}{P_0} \right). \quad (3)$$

If P_{A1} and P_1 are equal, that is, the reflating and deflating index for end of period inventory are equal

$$I_1(1 - 1) + I_0 \left(1 - \frac{P_{A1}}{P_0} \right) = 0 + I_0 \left(1 - \frac{P_{A1}}{P_0} \right), \quad (4)$$

which is the shortcut formula.

Under what conditions are P_{A1} and P_1 equal? In calculating the increase in the LIFO reserve for a quarter, P_{A1} is the average price index for the quarter. If the turnover period for the deflating index is exactly three months, using the short method and the long method will give identical results. When the turnover period for a firm is not three months, adjustments to the estimate can be made, based upon the degree of departure of the turnover period from a three-month average, if such an adjustment is considered material. Also, if a firm uses an early-period price option or an end-of-year price option to do LIFO, some adjustments may be required to the short method.

The critical issue is whether this method should be employed at the close of a quarter when it is relatively easy to make reasonable estimates of cost changes that the firm has actually experienced. That is certainly easier than projecting the future course of price changes. Furthermore, allocation of the LIFO reserve among quarters is accomplished on a more rational basis than by the pro-rata method, for example. The size of the increase in the LIFO reserve is dependent upon the price change, and any pro-rata approach must be inferior to using the actual quarterly price changes. Finally, the short method is simple to execute and to understand.

To demonstrate the method the example given in the October 9, 1975 AICPA letter to FASB is again used. In Worksheet 1 calculations are made using the long method for each of the first three quarters and the annual result given in table 8.2 of this chapter. In worksheet 2 calculations are made by the short method just outlined. In the AICPA example the firm has guessed the annual price change exactly. (Table 8.5 demonstrates the kind of errors that arise when a poor guess is made.) The results are assembled in table 8.7.

To repeat: The price indexes are 100 in the base period, and 100, 103, 105 and 109 for the four quarters, respectively. Prices do not change in the first quarter and the LIFO reserve increment must be zero by definition. There is no "capital

Worksheet 1. DOLLAR VALUE LIFO RESERVE, WITH TRUE QUARTERLY CALCULATION

Calculation	FIFO value (1)	Price index (2)	Reflating index (3)	(1) ÷ (2) (4)	Δ in base period prices (5)	(5) × (3) (6)	FIFO (7)	LIFO RESERVE	
								Increment (6) - (7) (8)	Cumulative (9)
Beginning inventory.....	1,000	100							
End of--									
1st quarter.....	1,030	100.0	100.0	1,030	30	30	30	0	0
2nd quarter.....	1,100	103.0	101.5	1,068	38	39	70	-31	-31
3rd quarter.....	1,250	105.0	104.0	1,190	122	127	150	-23	-54

Note: Columns (1) and (2) are from the example given in the October 9, 1975 letter from AICPA to FASB. For column (3) it is assumed that the average price for the quarter is the mid-point of the price indexes. Column (4) is the stock in base period prices. Column (6) is the change in average prices of the period. Column (7) is the quarterly changes in column (1). In columns (7) and (8) a negative sign means that the value must be subtracted from the FIFO value to obtain the LIFO inventory.

The calculations in this work sheet are the same steps as those appearing in table 8.2 which in turn are taken from the AICPA letter.

Worksheet 2. DOLLAR VALUE LIFO RESERVE, SHORT METHOD

Calculation	FIFO value (1)	Price index (2)	$1 - I_1/I_0$ (3)	Beginning inventory x col. (3) (4)	LIFO reserve cumulative (5)
Beginning inventory.....	1,000	100			
End of--					
1st quarter.....	1,030	100	0.000	0	0
2nd quarter.....	1,100	103	-.030	-31	-31
3rd quarter.....	1,250	105	1 ¹ -.019	-21	-52

¹1 - (105 ÷ 103).

Table 8.7. EXAMPLE: VARIOUS ESTIMATES OF INTERIM LIFO RESERVES

Period	AICPA methods		Long method (worksheet 1)	Short method (worksheet 2)
	Pro rata basis	Sales basis		
Quarter:				
1st.....	26	18	0	0
2nd.....	52	48	31	31
3rd.....	78	80	54	52
4th (actual end of year, see table 8.2).....	104	104	104	104
Implied 4th quarter increment.....	26	24	50	52

gain" on holdings of inventory when prices are stable. The large price change occurs in the fourth quarter (about 4 percent) and the increment should be largest in that quarter. Both actual calculations reflect these facts.

A simple way to view the problem is to think of a firm holding 100 lbs of stock of a fungible product, which it purchased on the last day of the previous quarter at 10 per pound. On the last day of the quarter it sells the 100 lbs at retail and also purchases 100 lbs at wholesale at a price of 12. The holding gain or increment in the LIFO reserve, calculated through using the short method, is the 1,000 of beginning inventory multiplied by 0.2, the price change over the holding or turn-over period.

STANDARD COST

A substantial number of manufacturing companies report inventories valued at standard cost to the Census Bureau. According to the M3 survey conducted in early 1976, 12 percent of inventories reported in manufacturing were valued at standard cost. The use of standard unit costs poses special problems in monthly surveys. Standards are changed, frequently every year, and unless the changes are properly identified in these surveys serious discontinuities may be introduced.

The importance of a change in standards can be seen from data submitted by Union Carbide Corporation to the SEC in response to the Commission's proposal regarding replacement cost.⁹ In the figures shown below, the first line represents the value of domestically held LIFO inventories, the second the LIFO reserve, and the third the FIFO value of inventories as of December 31. Each division of this company makes an annual revision of its standard costs as of January 1 of the succeeding year. The standard cost revision following December 31, 1973 constituted 6.4 percent of FIFO inventory cost and that following the December 31, 1974 balance sheet, 24.3 percent. Thus, on January 1, 1975 the firm regarded its standard cost inventory as \$1,027 million.

⁹SEC File S7579.

	(Millions of Dollars)	
	Dec. 31, 1973	Dec. 31, 1974
Balance sheet (LIFO).....	452	622
LIFO reserve.....	66	204
FIFO values.....	518	826
January first annual standard cost revision.....	33	201

According to APB Opinion No. 28, firms using standard cost for determining inventory and product costs should use the same procedures for reporting variances from standard at end of an interim period as they use at the end of their accounting year. Variances in purchase price, volume or capacity costs that are planned and that are expected to be absorbed by the end of the year should be deferred at the interim date.

The recommended procedure in Opinion No. 28 is a normalizing or smoothing device that can have important implications for reported inventories. Suppose a standard cost firm decides on a purchase price standard of 10 per unit for the coming year. Suppose further that the firm expects a steady rise in this purchase price through the year so that the quarterly pattern of purchase prices would be:

1st quarter.....	7
2nd quarter.....	9
3rd quarter.....	11
4th quarter.....	13
Average.....	10

If the firm has perfect foresight in forecasting the quarterly pattern, the average price of the inventory should be kept constant through the year until such time as the company changes its standard. Thus, such a firm is reporting essentially physical volume figures multiplied by a constant unit cost during the year. However, within a year BEA now treats the firm as though it were a FIFO company. The bias within a year depends on the nature of the standard adopted. If prices were rising, the adoption of a prospective price at the start of the year in the exam-

ple above would yield inventory figures that are too high in the first half and too low in the second half. If the standard adopted represents beginning-of-year costs instead of an estimate of average costs, there would be a persistent understatement, and if some past costs were used, the understatement would be all the greater. Distortions in BEA data, however, tend to be reduced because seasonal adjustment removes recurring patterns.

RECOMMENDATIONS

Early in 1976 the National Bureau of Economic Research made a number of recommendations designed to clarify reporting and eventual tabulations of monthly inventories. The Bureau of the Census adopted, on a limited basis, certain of these recommendations for manufacturing firms in the summer of 1976. Census increased the coverage late in the year and extended the new questions to the entire panel of affected reporters in the M3 survey at the start of 1977. The changes already made are described below in items 1 and 2, followed by additional recommendations. The new questionnaire and instructions appear in appendix I.

LIFO Firms

Recommendations Already Implemented

1. All known LIFO reporters are asked to separate their inventories each month into a LIFO portion and a nonLIFO portion.

2. Respondents are asked to indicate LIFO reserves associated with LIFO inventories.

The benefit of these two actions is that they permit the Census Bureau to measure the month-to-month behavior of LIFO inventories. Thereby it no longer is necessary for BEA to assume that LIFO proportions during the year are the same as at the end of the preceding year. In fact, it is already apparent from a limited sample of firms reporting that patterns of LIFO and nonLIFO inventory changes are not identical within the same company. The new questions also permit identification of firms that are not actually reporting LIFO values.

Recommendations Not Yet Implemented

3. It is known that some firms report true LIFO inventories only at the end of their accounting years. Firms in this category fall into two groups. First are those firms classified as LIFO companies but who report FIFO inventories for all interim periods. There probably are not many of these, but even a small number can distort survey results. The extent of this phenomenon cannot be determined until after a full year of reporting on the new questions has been completed (1978). Second are those firms who report an unchanging LIFO reserve with their LIFO inventories. These firms are not reporting bona fide LIFO inventories and although it is conceivable that they have projected no price change for their LIFO stocks, such a projection is highly dubious under present economic conditions. The Census Bureau should contact such reporters to determine

if in fact they are making a bona fide calculation of LIFO reserves or are reporting unchanging reserve figures because they have no procedure for making LIFO estimates in their interim reporting. Census should obtain bona fide LIFO figures from such firms if possible. If not, these reporters should be grouped with FIFO and average cost reporters.

4. The same questions now being asked of manufacturers each month should be asked of wholesalers and retailers using the LIFO method.

5. A question should be asked of all respondents so those changing their method of accounting since their last Census report can be identified. This question is needed because the panel of known LIFO reporters is selected from responses to the preceding yearend survey of accounting methods used to value inventories at the end of the preceding year. When a firm adopts LIFO at midyear in Census reports, it is necessary to obtain figures on the new basis for the earlier months of the year.

6. The information from the above improvements should be tabulated and made available to BEA as rapidly as possible so it may be incorporated into GNP inventory estimates.

Standard Cost Firms

As a result of early NBER recommendations, standard cost reporters are now asked to differentiate standard cost inventories from others and to note if there have been changes in unit cost standards since last reporting. If so they are asked to report the latest month on the old valuation base (see appendix I).

Asking this new question yields several advantages. It should now be possible to measure standard cost inventories more accurately when firms use standard cost as well as other methods. Standard cost inventories at a given standard tend to reflect inventories valued at unchanging unit costs. When separate tabulations can be made of such standard cost inventories, BEA should cease treating them as though they were FIFO-type firms and make the separate tabulations.

Seasonal Adjustment

The problem of seasonal adjustment has special relevance to inventories in the context of interim reporting. A good system of interim reporting to stockholders should show the course of sales, profits and other financial variables as they evolve through the year without regard to recurrent seasonal influences. The accounting profession, at least in the principles enunciated by FASB, does not make use of seasonal adjustments of the kind commonly employed by economists and statisticians. For quarterly reporting the accounting profession should adopt seasonal adjustment techniques that have been known and practiced for many decades.¹⁰ This is long overdue.

The only mention of seasonality in APB Opinion No. 28 is in paragraph 28: Where seasonal variations in revenue are "material" businesses should disclose the seasonal nature of their activities and "consider supplementing their interim reports with information for twelve-month periods ended at the interim date for the current and preceding years." This state-

¹⁰For some early interest on the part of accountants, see A. Fisher, "A Brief Note on Seasonal Variation," *Journal of Accountancy* (September 1937), pp. 174-199.

ment is consistent with the method typically used by businesses to present quarterly results in which a given quarter is compared with the corresponding quarter of the preceding year (or years). Indeed, it would be difficult to find a reporting method that is as deeply rooted as this same-period-a-year-ago comparison. Yet, this type of comparison is subject to serious shortcomings, as students of the business cycle have known for a long time.

The technique of comparing a given quarter with the same quarter in the preceding year is helpful primarily when activity in the preceding year is relatively smooth. It can yield misleading results if a business cycle turning point occurred at some time in the preceding year, or if the rate of change within the year shifted markedly.¹¹ In this regard the behavior of manufacturers' sales in the recent recession and recovery is of interest. Seasonally adjusted average monthly sales in 1972 prices are shown below by quarters:

Billions of Dollars Seasonally Adjusted, Monthly Rate

Quarter	1974	1975	1976
1	68.5	57.0	63.1
2	67.6	57.8	64.6
3	66.6	60.2	64.3
4	62.6	60.9	64.5

Source: Unpublished Bureau of Economic Analysis data.

¹¹See comments by Donald Daly in *The Quality and Economic Significance of Anticipations Data* (Princeton University Press: National Bureau of Economic Research, 1960), pp. 236-237.

In all four quarters of 1975 firms using the same-quarter-a-year-ago technique would have reported substantial, if diminishing, decreases in real sales even though sales on a seasonally adjusted basis began to recover in the second quarter of 1975. By the time large over-the-year increases in sales finally began to appear—in the first quarter of 1976—the seasonally adjusted quarter-to-quarter change was beginning to slow down (first quarter to second quarter 1976).

A more meaningful description of the course of sales and other financial variables is only one of the advantages that would result from the use of seasonal adjustments. There are other advantages directly related to inventory measurement. Earlier, problems of temporary declines in LIFO inventories, and how accountants attempt to smooth them out, were discussed. There are benefits to be gained from the accounting practice of eliminating temporary increases in profit and loss and balance sheet items which have no particular economic significance for the firm, even though it is not recommended here. However, there are even greater advantages if accountants make use of conventional seasonal adjustments; they would have more objective criteria of what constitute temporary declines in LIFO stocks. FASB could rule that a decline in LIFO stocks that fell outside a certain range of prior year observations (for example, ratios to moving averages) would have to be treated as a decline unless it was clearly the result of a specific random event whose impact could be reversed within the year. This suggestion is consistent with the principles of APB Opinion No. 28 as it now stands.